

R-CarM2 System Evaluation Board
RTP0RC7791LCB00010S (PORTER Rev.B)
Setup Manual
Rev.0.01

Revision History

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1. Introduction

This setup manual describes the settings of switches mounted on the R-CarM2 system evaluation board "PORTER(REV.B)."

For the correspondence between the functions of the PORTER(REV.B) board and the connectors mounted on the board, see section 1.1, Location of Connectors on the PORTER(REV.B) Board.

For the correspondence between the numbers and locations of the switches mounted on the PORTER(REV.B) board, see section 0, Location of Switches and Jumper on the PORTER(REV.B) Board.

For the initial settings of slide switches mounted on the PORTER(REV.B) board, see section 2.1, Initial Settings of .

1.1. Location of Connectors on the PORTER(REV.B) Board

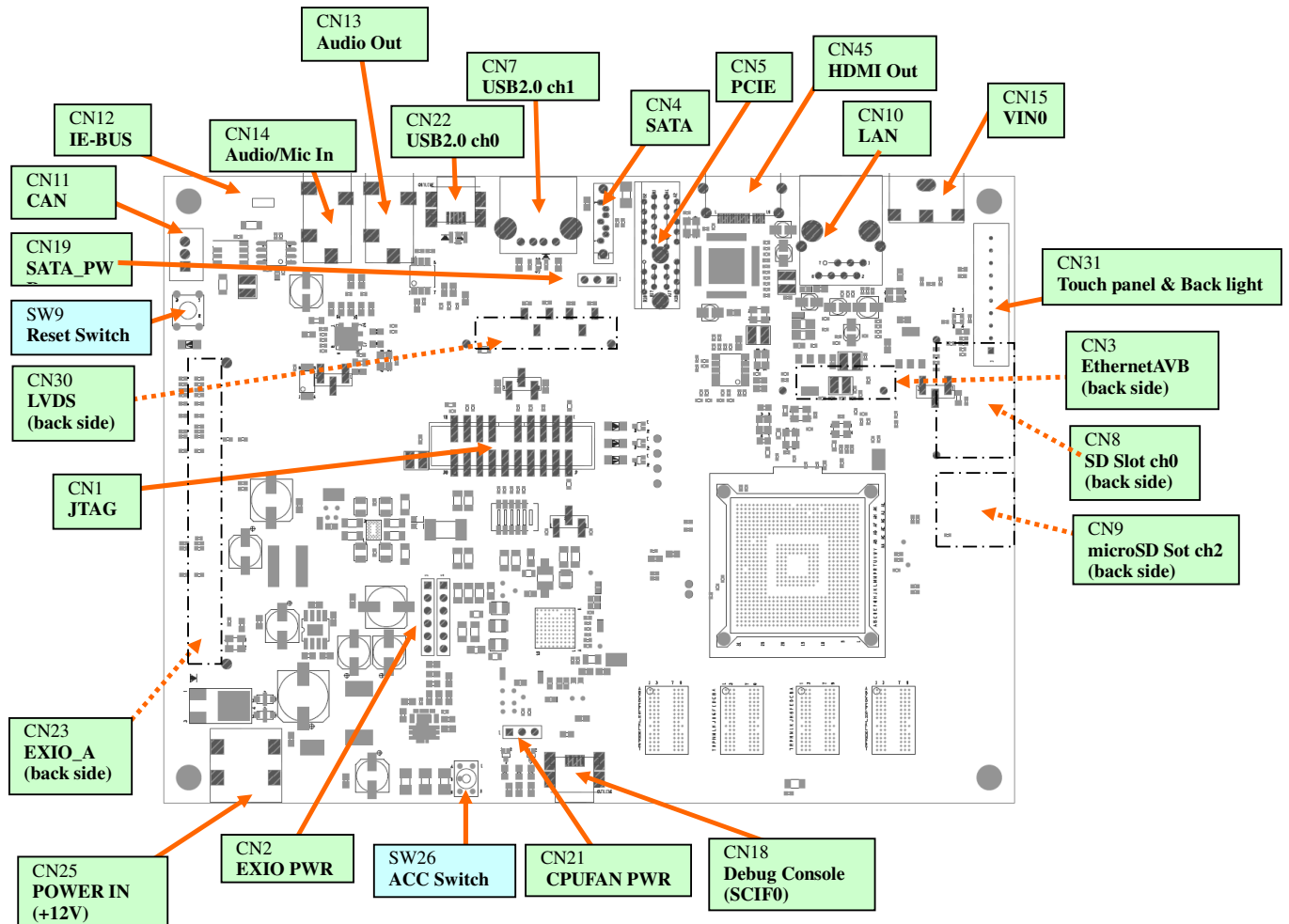


Figure 1.1.1 Location of Connectors on the PORTER(REV.B) Board

Location of Switches and Jumper on the PORTER(REV.B) Board

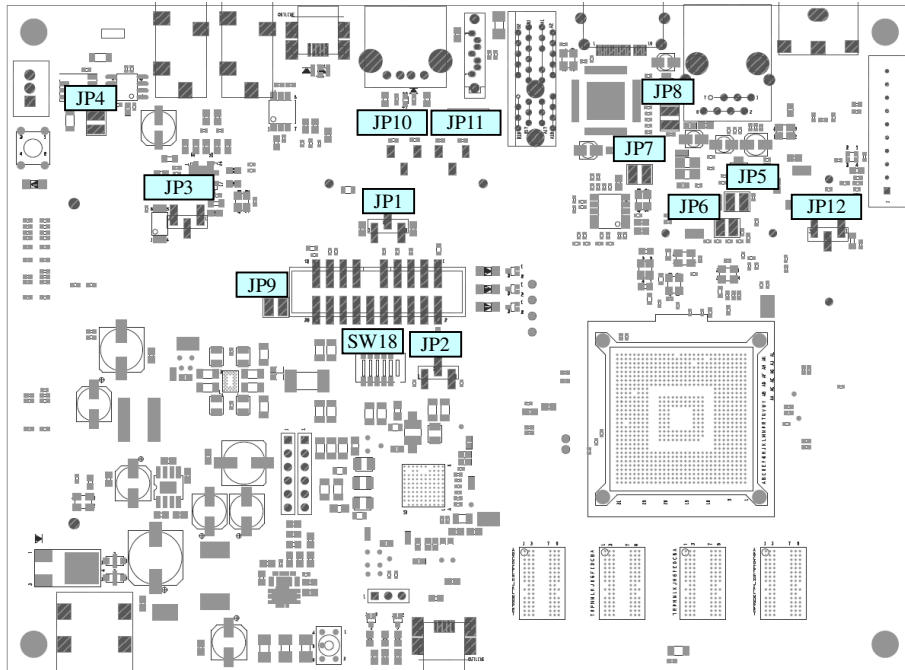


Figure 1.1.2 Location of Switches on the PORTER(REV.B) Board (Top Side)

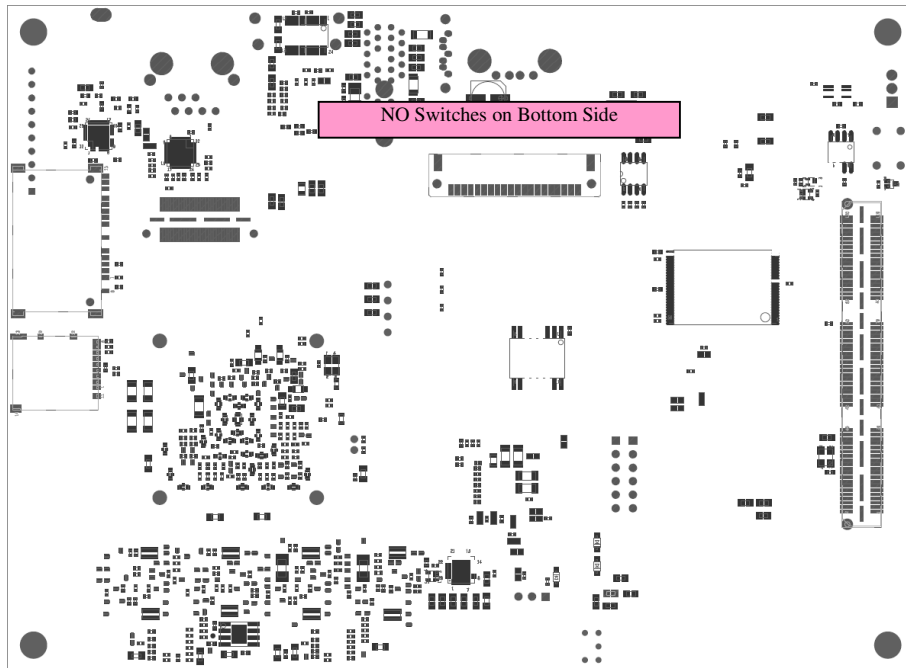


Figure 1.1.3 Locations of Switches on the PORTER(REV.B) Board (Bottom Side)

1.2. Quick Setup of the PORTER(REV.B) Board

1.2.1. Installing the USB Driver

The PORTER(REV.B) board uses Silicon Labs' USB-to-UART Bridge controller, CP2102. Firstly, install a USB driver for the CP2102 (a virtual COM port driver). Download the driver from the website below.

[VCP Driver kit]

<http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>

1.2.2. Connecting the PC and PORTER(REV.B) Board

For connection between the PC and PORTER(REV.B) board, use a USB cable (type A to mini AB). Connect the type A end to the PC and the mini AB end to CN18 (Debug Serial 0 / SCIF0) on the PORTER(REV.B) board. For the location of CN18, refer to Figure 1.1.1 Location of Connectors on the PORTER(REV.B) Board.

1.2.3. Settings for Terminal Emulation Software on the PC Side

Set up the serial communications protocol for the terminal emulation software on the PC side as follows.

Communications rate	38.4 kbps (38,400 bps)
Data length	8 bits
Parity bits	None
Stop bits	1 bit
Flow control	None

1.2.4. Confirming Activation of the 'u-boot' on the PORTER(REV.B) Board

Connect the 12-V DC plug of the AC adapter supplied with the PORTER(REV.B) board to CN25 and then plug the other end of the adapter into the outlet. Subsequently, switch Power/ACC switch (SW26) to the on side.

The PORTER(REV.B) board is activated and the following message is displayed on the screen of the terminal emulation software.

```
KOELSCH SPI_LOADER(DDR3L_1333) V0.16a 2014.10.03
DEVICE S25FL512

U-Boot 2013.01.01-gc4d5d6e (Nov 13 2014 - 17:21:53)

CPU: Renesas Electronics R8A7791 rev 2.0
Board: Porter Board

DRAM: 1 GiB
MMC: sh-sdhi: 0, sh-sdhi: 1, sh-sdhi: 2
SF: Detected S25FL512S with page size 256 KiB, total 64 MiB
In: serial
Out: serial
Err: serial
Net: sh_eth
Hit any key to stop autoboot: 0
sh-sdhi: Cmd(d'1) err
sh-sdhi: cmdidx = 1
Card did not respond to voltage select!
** Bad device mmc 2 **
## Starting application at 0x48100000 ...
```

The above screen shows the board booting from the default NOR flash interface. The error message "Card did not respond to voltage select!" indicates the board tried to boot from the micro-sd card but a micro-sd card was not inserted.

Alternatively, the board can be booted through the QSPI interface by shorting the JP8 jumper as described in Section 2.1.8. When booting with the QSPI flash, the screen should look similar to the one below.

```
U-Boot 2013.01.01-g0308ea0-dirty (Jan 09 2015 - 20:09:53)
```

```
CPU: Renesas Electronics R8A7791 rev 2.0
```

```
Board: Porter Board
```

```
DRAM: 1 GiB
```

```
Flash: 64 MiB
```

```
MMC: sh-sdhi: 0, sh-sdhi: 1
```

```
*** Warning - bad CRC, using default environment
```

```
In: serial
```

```
Out: serial
```

```
Err: serial
```

```
Net: Please set MAC address
```

```
sh_eth
```

```
=>
```

For the location of ACC(Power) switch SW26, see Figure 1.1.1 Location of Connectors on the PORTER(REV.B) Board.

1.2.5. Precautions

When the AC adapter is connected to the outlet, the 12-V DC power is supplied to the PORTER(REV.B) board and some of the circuitry start operating. Setting the ACC switch (SW26) to the on side after that leads to the generation of various power supply levels (including 5.0-V DC and 3.3-V DC) from the 12-V DC power.

Notes on Usage

- Performing the following operations while the AC adapter is plugged into the outlet might fatally damage the PORTER(REV.B) board.
 - (1) Mounting or dismounting an optional board
 - (2) Plugging in or unplugging a cable
 - (3) Modifying switch settingsUnplug the AC adapter from the outlet when performing the above operations.
- For the PORTER(REV.B) board, be sure to use the power supply that comes with it. Applying a voltage greater than 12 V may damage devices on the PORTER(REV.B) board.
- There are sequences for turning on and off the power supply to the R-CarM2. For the PORTER(REV.B) board, be sure to obey the notes below.
 - (1) When power is turned on
Before plugging the AC adapter into the power source, be sure to confirm that the ACC switch (SW26) is off.
It is prohibited to plug the AC adapter into a power source while the ACC switch (SW26) is on.
 - (2) When power is shut off
Before unplugging the AC adapter from the power source, be sure to turn off the ACC switch (SW26).
It is prohibited to unplug the AC adapter from the power source while the ACC switch (SW26) is on.
- The typical default value for overcurrent detection by the power IC (IR3838MPBF) is defined as 7 A in the specifications. The maximum current drawn by the VSYS and D5.0V pins on the PORTER(REV.B) board is thus 7 A each. Therefore, operation should be such that the current drawn by either pin does not exceed 7 A. Also ensure that the current drawn does not exceed 7 A if an IO expansion board or external storage device is connected to the PORTER(REV.B) board.

1.2.6. Notes on Pin Function Control

For connection with the mini-monitor which comes with the PORTER(REV.B) board, the following signals are set as GPIO outputs.

- GP7_7/MLB_CK/HCK1
- GP7_8/MLB_SIG/HCTS1#
- GP7_9/MLB_DAT/HRTS1#

In evaluation of the MLB, HSCIF1, and so on (evaluation which entails data output from the peripheral devices) with the PORTER(REV.B) board, be sure to change the settings for pin function control beforehand in order to avoid collision of the R-CarM2 and output signals.

2. Switch Settings

This section describes the settings of slide switches mounted on the PORTER(REV.B) board.

2.1. Initial Settings of Jumper Switches

The following describes the initial setting and function of each slide switch on the PORTER(REV.B) board. **These settings are valid only when the PORTER(REV.B) board is switched on along with the launching of the mini-monitor supplied with the PORTER(REV.B) board. To launch any other program than the mini-monitor, reconfigure the slide switches according to the pin function (PFC) and GPIO functions related to that program.**

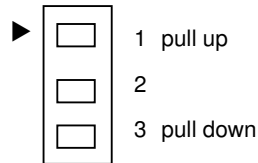
Table 2.1.1 Initial Setting of Jumper Switches

Jumper Number	Jumper Name	Jumper Surface	Settings			
			[1-2]	[2-3]	NC(OFF)	
JP1	TRST#	T			✓	TRST# floating
JP2	SPI_SEL	T		✓		Select QSPI (U16: S25FL512S)
JP3	SSI_SDAT A1	T	✓			Connect SSI1 AK4642 as 'LINE/MIC Input'.
JP4	CAN	T		-	✓	CAN termination (120ohm) OFF
JP5	1.2V	T			✓	Only for use with AVB extension board
JP6	TX_ER	T			✓	Only for use with AVB extension board
JP7	AVB_GTXREFC	T		-	✓	Disable EthernetAVB clock
JP8	BootMode	T			✓	Boot from QSPI
JP9	DebugMode	T		-	✓	Coresight Debug
JP10	Scan Direction	T	✓			3.3K pullup to 3.3v
JP11	Color Resolution	T			✓	Floating
JP12		T			✓	Only for use with AVB extension board
Switch Number	Switch Name	Switch Surface	Settings			
			(ON)		(OFF)	
SW18	Address	T		-	✓	ALL OFF -> Address lines reserved for QSPI

2.1.1. JP1 (TRST#) Specifications

JP1 selects whether to pull up or down the TRST# pin of the R-CarM2. The following shows the initial setting at shipment.

[JP1]



Function: TRST# Pull-up/Pull down Selection

JP1	1-2 short	TRST# pull up.
	2-3 short	TRST# pull down.
	N.C.	TRST# open.

Figure 2.1.1 JP1 Settings

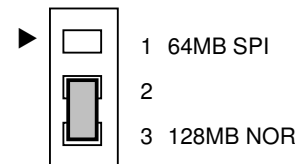
2.1.2. JP2 (SPI Flash Memory Connection Selection) Specifications

The PORTER(REV.B) board is equipped with the SPI flash memory of 64MB (U16: S25FL512SAGMFIG11) and the NOR flash memory of 128MB (U13: S29GL01GP).

When JP2 selects the SPI flash memory to be connected to the A25/SSL pin of the R-CarM2. When JP2 is set to the pin 1 side, the SSL pin of the R-CarM2 is connected to the flash memory of 64 MB. When JP2 is set to the pin 3 side, the SSL pin of the R-CarM2 is connected to the NOR flash memory of 128 MB.

The following shows the initial setting at shipment.

[JP2]



Function: SPI Flash Memory Connection Selection

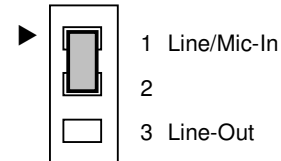
JP2	1-2 short	Select 64MB flash: U16(S25FL512SAGMFIG11)
	2-3 short	Select 128MB flash: U13(S29GL01GP)
	Open	Reserved (for external SPI-flash board.)

Figure 2.1.2 JP2 Settings

2.1.3. JP3 (SSI_SDAT1 Connection Selection) Specifications

JP3 selects a device to be connected to the SSI_SDAT1 (GP-2-5) pin of the R-CarM2. The following shows the initial setting at shipment.

[JP3].



Function: SSI_SDAT1 Connection Selection

JP3	1-2 short	Line- In/Mic-In from AK4642EN (Line In)
	2-3 short	Line- Out to ADV7511W (HDMI out)
	Open	(Setting prohibited)

Figure 2.1.3 JP3 Settings

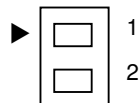
Table 2.1.3 SSI_SDAT1 Connection Selection

Setting	Function
[1-2] short	<ul style="list-style-type: none"> Connects the SSI_SDAT1 pin of the R-CarM2 to the SDTO pin (pin 12) of the AK4642EN (U24). (Initial setting) Sets the SSI_SDAT1 pin of the R-CarM2 to input.
[2-3] short	<ul style="list-style-type: none"> Connects the SSI_SDAT1 pin of the R-CarM2 to the I2S1 pin (pin 6) of the ADV7511W (U44). Sets the SSI_SDAT1 pin of the R-CarM2 to output.
N.C.	<ul style="list-style-type: none"> Setting Inhibited (No Connect)

2.1.4. JP4 (CAN termination Selection) Specifications

JP4 selects whether to terminate or not the CANH/CANL pin signal. The following shows the initial setting at shipment.

[JP4]



Function: CAN Termination Selection

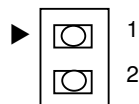
JP4	Short	Enable CAN termination (120 ohm)
	Open	Disable CAN termination

Figure 2.1.4 JP4 Settings

2.1.5. JP5 (EtherAVB Voltage Supply) Specifications

JP5 selects whether to enable or disable 1.2V power going to pins 57 and 59 on the Ethernet AVB expansion Header. The following shows the initial setting at shipment.

[JP5]



Function: EtherAVB Voltage Supply

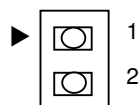
JP5	Short	Enable 1.2V
	Open	Disable 1.2V

Figure 2.1.5 JP5 Settings

2.1.6. JP6 (EtherAVB Error Signal) Specifications

JP6 selects whether to enable or disable the Transmit Error signal originating from the Ethernet AVB expansion board. The following shows the initial setting at shipment.

[JP6]



Function: EtherAVB Transmit Error Signal

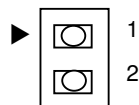
JP6	Short	Enable transmit error signal
	Open	Disable transmit error signal

Figure 2.1.5 JP6 Settings

2.1.7. JP7 (EtherAVB Clock Selection) Specifications

JP7 selects whether to enable or disable 'AVB_GTXREFCLK' signal. The following shows the initial setting at shipment.

[JP7]



Function: EtherAVB Clock Selection

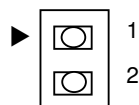
JP7	Short	Enable EthernetAVB clock (125MHz)
	Open	Disable EthernetAVB clock

Figure 2.1.5 JP7 Settings

2.1.8. JP8 (BootMode) Specifications

JP8 selects whether to boot from the QSPI flash chip or the NOR flash chip. The following shows the initial setting at shipment.

[JP8]



Function: EtherAVB Clock Selection

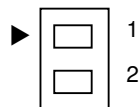
JP8	Short	Boot from NOR flash
	Open	Boot from QSPI flash

Figure 2.1.5 JP8 Settings

2.1.9. JP9 (Debug Mode Selection) Specifications

JP9 selects CN1(JTAG port) function. The following shows the initial setting at shipment.

[JP9]



Function: Debug Mode Selection

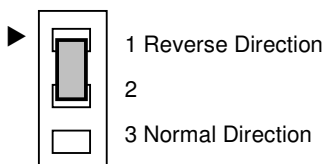
JP9	Short	JTAG function(CN1) = Boundary Scan
	Open	JTAG function(CN1) = Coresight (ARM CA15)

Figure 2.1.6 JP9 Settings

2.1.10. JP10 (DPS/Scan Direction Selection) Specifications

JP10 selects scan direction of LCD panel whether normal or reverse. The following shows the initial setting at shipment.

[JP10]



Function: DPS/Scan Direction Selection

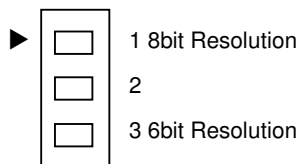
JP10	1-2 short	Reverse Direction ('H')
	2-3 short	Normal Direction ('L')
	Open	Setting prohibited

Figure 2.1.7 JP10 Settings

2.1.11. JP11 (FRC/Color Resolution Selection) Specifications

JP11 selects color resolution of LCD panel whether 8bit (16,777,216 colors) or 6bit (262,144 colors). The following shows the initial setting at shipment.

[JP11]



Function: FRC/Color Resolution Selection

JP11	1-2 short	8bit Resolution (16,777,216 colors) ('H')
	2-3 short	6bit Resolution (262,144 colors) ('L')
	Open	Not specified

Figure 2.1.8 JP11 Settings

2.2. Push-Switch Specifications

2.2.1. SW9 (System Reset Switch) Specifications

Pushing SW9 resets the R-CarM2.

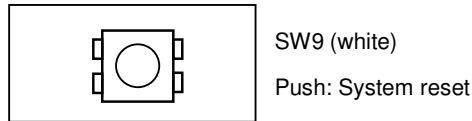


Figure 2.2.1 SW9 System Reset Switch

Table 2.2.1 System Reset Switch

SW Setting	Function
Push	Resets the R-CarM2. A reset signal is applied to the power-on reset pin (PRESET#) of the R-CarM2. As a result, the R-CarM2 outputs a reset signal to peripheral devices.

2.3. Toggle Switch Specifications

2.3.1. SW26 (Board Power-Supply Circuit Control) Specifications

The power-supply circuit on the PORTER(REV.B) board is controlled by using SW26 (accessory :ACC) switch.

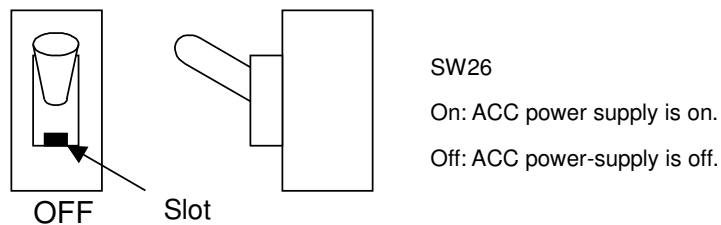


Figure 2.3.1 SW26 Accessory Power-Supply Switch

Table 2.3.1 Accessory Power-Supply Switch

SW26 Setting	Function
Towards opposite side of 'OFF' marking	Turns on the PORTER(REV.B) board accessory power. As a result, the power-supply voltage is supplied to the system.

When the switch is 'ON,' the switching regulator (such as U576: IR3838MPbF) starts generating the power.

2.4. Appendix (Resister installation option)

2.4.1. DDR1600 => DDR1333 mode

MD19='L' ...DDR1600 mode(default)

MD19='H' ...DDR1333 mode

Procedure)

Remove R530(10k) and install R523(100k) for 'DDR1333 mode'.

Install R530(10k) for 'DDR1600 mode'.

2.4.2. R-CarM2W => R-CarM2N

MD22='L' ... R-CarM2N, DDR 32bit x1ch

MD22='H' ... R-CarM2W, DDR 32bit x2ch (default)

Procedure)

Install R560(10k) for 'R-CarM2N'.

Remove R560(10k) for 'R-CarM2W'.

2.4.3. Non Secure mode => Secure mode

MD5='L' ... Secure mode

MD5='H' ... Non Secure mode (default)

Procedure)

Install R616(10k) for 'Secure mode'.

Remove R616(10k) for 'Non Secure mode'.